

DrägerService

Installation site: _____

Explanation of symbols

| | |
|-----------------------|-----------------------|
| — OK | C = Check condition |
| Defect/error/fault | O = Check function |
| ○ Spare parts used | L = Check for leakage |
| / Report | V = Enter test value |
| ⌒ Accessories missing | |

Serial no.: _____

Date of delivery/
startup: _____

Invoice no. or
delivery no.: _____

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Other: _____

1. Information about accompanying documents

1.1 Instructions for Use

Incubator 8000 d/e:

GA 6141.21-90 27 341

1.2 Equipment manual

1.3 Instructions for Use for special accessories.

Instructions for Use must be available in appropriate combination in line with entry in equipment manual.

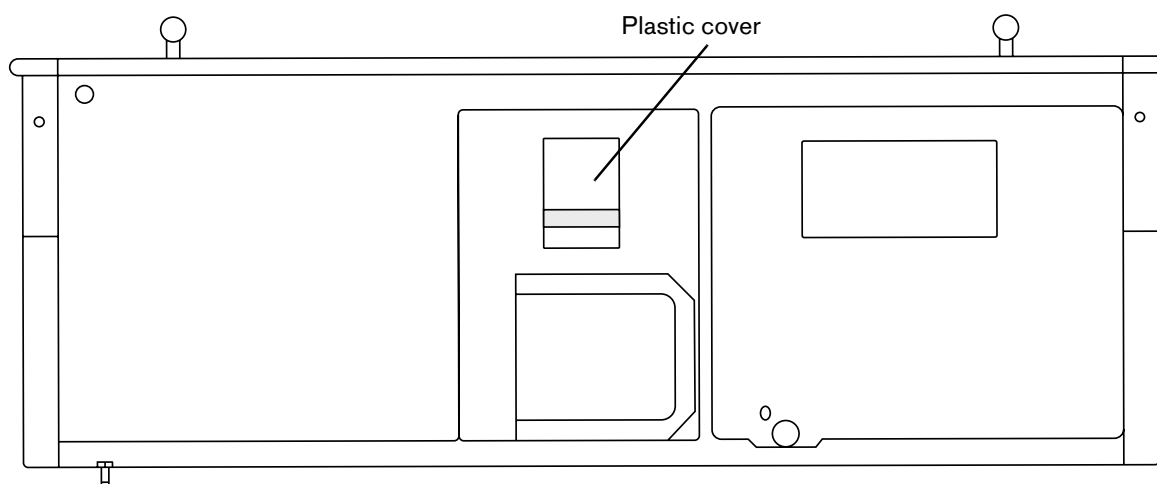
2. General condition

| | | | | | | | | | | | | | |
|-------|--|-----|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 2.1 | Trolley | C | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.1.1 | 2 castors and 2 lockable castors Check function of brake, Check tight fit of screwed connections | C O | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.1.2 | Protective caps (orange) | C | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.1.3 | Height adjustment | C | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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| 2.1.4 | Check screw fastenings | | |
| | 4 Allen screws between trolley and pedestal | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.2 | Cabinet left, right (if applicable) | C O | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.3 | Pedestal with cover Inc. 8000 | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.3.1 | Doors with hinge compl. 2M 19729 and magnetic lock 2M 19718 | C O | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.3.2 | Supply connection incl. device socket 1809822, power cord feedthrough 2M 18642 and power cord 2M 13126 | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.3.3 | Main power switch (= thermal overcurrent blocking device) | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |

- 2.4 Incubator backpanel
- 2.4.1 Checking that plastic cover is fitted properly.

Warning:
The plastic cover covers the power connection. Unplug the power cord before carrying out the test.



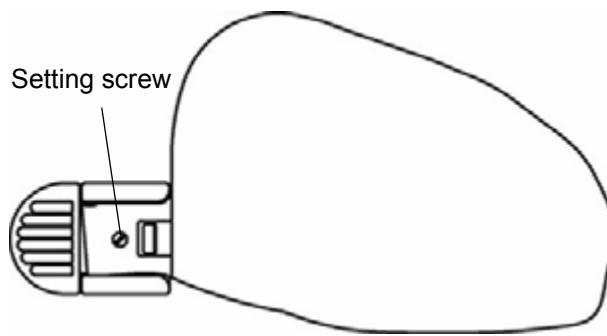
Procedure: Press against the plastic cover using one finger.

The plastic cover should not move. If the plastic cover should come off, glue it on using Wacker Elastosil E50.

| | | | |
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| 2.4.2 | Flap compl. 2M 19626 with catch 2M 19271 and retaining strap 2M 12045 | C O | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.4.3 | Filter receptacle: Sheet steel 2M 19538 in front of the filters with screws 2M 19616 and retaining rings 13 31 418 | C O | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |

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| 2.4.3.1 | Sealing 2M 19642 for sheet steel | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.4.3.2 | Sealings R 28225 behind the filters | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.4.4 | * Replace fresh air filter 84 02 926 | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.4.5 | Sticker 2M 20056 „dest. water“ | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.5 | Handles 2M 19541 at the front of the incubator | | |
| 2.6 | Connection socket for external oxygen supply | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.7 | Incubator canopy | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.7.1 | Air temperature sensor with holder | | |
| 2.7.1.1 | Swivel out air temperature sensor | | |
| | There must not be a gap greater than 0.5 mm between sensor housing and metal or plexiglass block below the air temperature sensor. | C O | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.7.1.2 | Remove air temperature sensor from retainer and examine connector, cable and female connector for external damage | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.7.2 | Swivel window with seals | | |
| | Adjust swivel window such that pane makes contact with seal. Check engagement and holding; to do so shut swivel window by exerting slight pressure such that retainer engages precisely. Then pull with fingers on outer edge of swivel window and move swivel window up and down: swivel windows must not open. | C O | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| | Note: If these requirements are not met although the catch and the swivel window are in good condition, the bump rubber in the catch has to be shortened. If the force applied to the bump rubber can be adjusted with a setting screw, proceed as follows: | | |

- 2.7.3 Adjust the swivel window using the setting screw.



Slowly turn the setting screw of the retainer clockwise until the previously closed swivel window opens. Then turn setting screw 2 full turns counter-clockwise.

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Repeat test item [2.7.2](#).

- 2.7.4 Hose feedthrough 2M 19511, 6x or 8x

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- 2.7.5 Double walls with holder (must be available)

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- 2.7.6 Front flap compl. 2 M 19525 with catches 2M 19899, double wall (must be available), catches for double wall 2M 19516 and 2 retainers 2M 19848 with 2 O-rings each.

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- 2.7.6.1 Spring catches of front flap

Check function of the reset spring

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- 2.7.6.2 * Replace spring 84 00 496 of spring catches every 6 years.

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- 2.7.6.3 Hinge frame 2M 19542
(Note: When disassembling the hinge frames turn Allen screw clockwise)

- 2.7.6.4 Tappet compl. 2M 19543, 2x

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Function of the reset spring.

- 2.7.7 Canopy holder

Afterwards remove front flap, air temperature sensor and canopy.

Bed with mattress

Check that openings for supports are not damaged and the holding plates are screwed on tightly.

CO

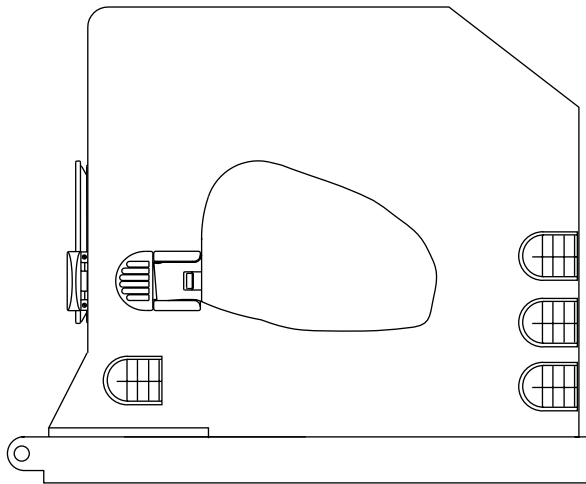
[illegible]

Important for removable double wall option: If no removable double wall is fitted to the canopy back, a bed extension 2M 21225 must be available (to be plugged onto the rear side of the resting surface and covering the gap between the resting surface and rear canopy wall).

Note:

Applies to bed 2M 20888 only:

Do not use a bed extension if the incubator has a canopy with curved rear panel and if the rear double wall is fitted, otherwise there is a risk of temperature loss.



2.8.1 Hose holder 2M 19630 (if available)

C

[illegible]

2.8.2 Bed height adjustment

The bed can be pulled out at any height and any inclined position. Exert hand force on bed in pulled-out condition.

CO

[illegible]

2.8.3 Supports 2M 19654 for bed height adjustment.

C

[illegible]

Then remove bed and supports.

2.8.4 Labels

The "Warning" labels "1" shown below on the front and rear of the bed area are present and not damaged (Note: If the bed edge is too narrow the label should be affixed on the outside on the rear of the cover).

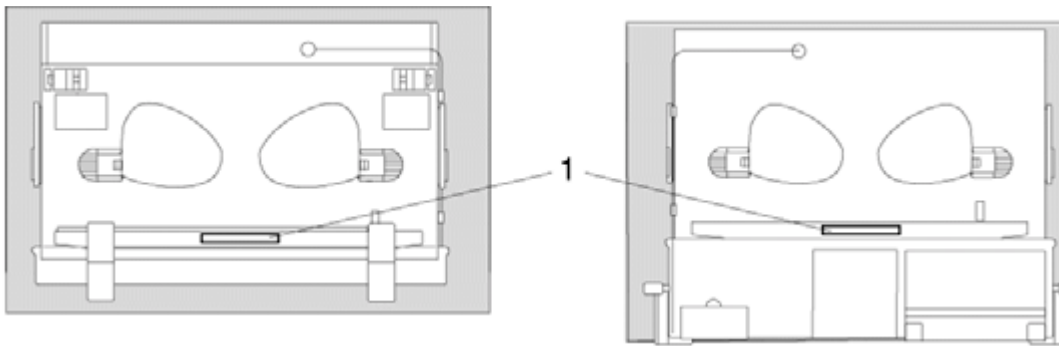
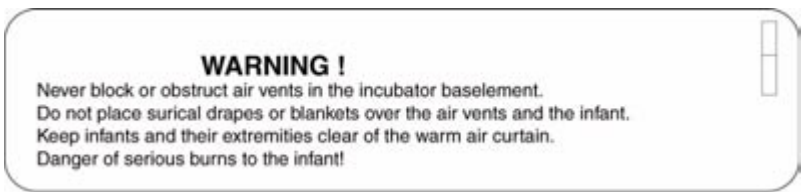


Fig.: Front (left) and rear (right) of bed area



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Part numbers of labels:

| | |
|---------|---------------------|
| 2M22228 | German, Dutch |
| 2M22229 | English, French |
| 2M22230 | Italian, Greek |
| 2M22231 | Spanish, Portuguese |
| 2M22232 | Swedish, Finnish |
| 2M22233 | Norwegian, Danish |
| 2M22234 | Russian, Japanese |

Note: Each part number includes two labels in each specified language, e.g. 2M22228 contains two labels in German and two in Dutch.

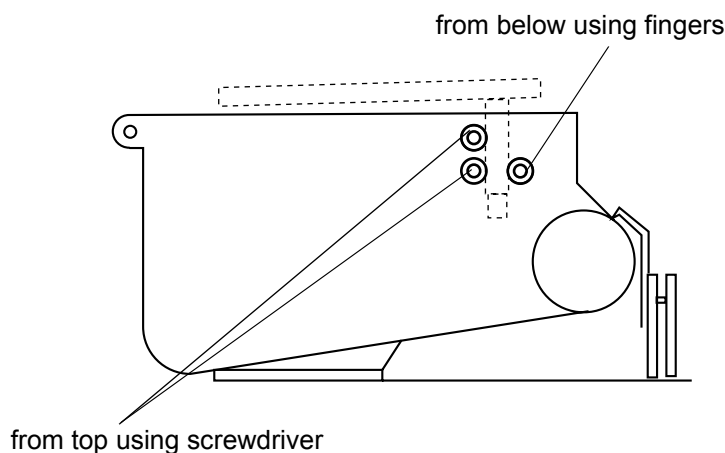
2.9 Intermediate element 2M 19537 (cover surface)

C

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| 2.10 | Impeller compl. 2M 20205 with metal cone and O-ring M 19241 (large) and O-ring 22364 (small) or silicone cone 2M 20542 or impeller 2M 19665 | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.11 | Trough 2M 19334 with 2x seal 2M 19595 for the supports Then remove impeller and trough. | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.12 | Aggregate seal 2M 19637 | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |

- 2.13 Testing ball bearing of height adjustment supports
- Open flap underneath electronics assembly. Check 2 x 3 ball bearing set for easy movement as shown in the Figure below.

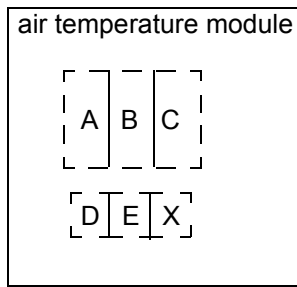


If the ball bearing set does not move easily, replace the whole set 1330128 (3).

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| | | C O | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.14 | Seal 2M19638 between motor and trough | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.15 | Seal 2M 20023 between heating and trough | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.16 | Motor | | |
| 2.16.1 | Lubricate motor with oil 2M 07839, to do this remove screw next to motor shaft and pour 10 drops of oil into the threaded bore. | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.16.2 | Check axial play | | |
| | Test value approx. 0.2 mm | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |

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| 2.17 | <p>Condition of boiler</p> <p>Disassemble boiler.</p> <p>Check condition once a year.</p> <p>Warning: Before checking the boiler, disconnect power cord and allow boiler to cool down! If necessary, scrape out interior of boiler.</p> <p>Note: From 1990 the boiler housing is made of seawater-resistant aluminium (light surface) and can be scraped out without problems.</p> | C | <div></div> |
| 2.17.1 | <p>Evaporator cap</p> <p>Serial boiler (milled):</p> <p>Cap 2M 20040 or cap 2M 20105 with O-ring 2M 08777</p> <p>Boiler of boiler-conversion kit: Cap 2M 20292 with O-ring 2M 08777</p> | C | <div></div> |
| 2.17.2 | <p>Sealing in the fresh air intake between unit and basic housing</p> | C | <div></div> |
| 2.17.3 | <p>Cleaning of unit inside</p> | C | <div></div> |
| 2.17.4 | <p>Check screwed connections</p> <p>4 Allen screws between pedestal and basic housing.</p> <p>Mount unit.</p> | C | <div></div> |
| 2.18 | <p>Valve in the fresh air intake at the bottom side of the incubator housing (not available in all Inc. 8000). The leak test is performed under item 6.5.</p> | C | <div></div> |
| 2.19 | <p>Fan failure test</p> <p>to do so, mount trough and canopy without impeller, connect and swivel in air temperature sensor, switch incubator on.</p> <p>Following 30 s self-test (dashes only on actual value displays of all modules) fan failure alarm is given by means of a continuous tone and visually by the corresponding alarm LED „fan failure“ in the air temperature module lighting up, heating LED off. The audible alarm cannot be suppressed by pressing the button „horn off“.</p> <p>Switch unit off and assemble it in ready-to-operate condition, do not close flap below electronics module.</p> | O | <div></div> |

| | | | |
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| 2.20 | Flap in front of membrane keypad | | |
| | Legibility of brief operating instructions | C O | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.21 | Membrane keypad | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.22 | Additional fan In retrofitted devices the additional fan is located on the backpanel next to the sensor connector, in units from I / 89 it is located below the trough. | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.23 | Seca balance (if applicable) with plug-in power pack 2M 20 640, battery 83 01 856 and label „do not pull out“. | | |
| 2.23.1 | Function test Line up balance until water level is vertical. Press button „check“ when balance is unloaded: Indication of weight shows „test“. Then LEDs and all segments of the indication of weight (8888) are switched on and off several times. Then a test value is indicated which must be between 8990 and 9010. The end is indicated by text „end“. | O | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.23.2 | Calibration of Seca balance (only applies in the Federal Republic of Germany) Customer must be informed, if the calibration validity period is less than 6 months. | O | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 2.24 | Monitor rack 2M 19460 (if applicable) | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 3. | Record operating data, air temperature sensor switch test, comparison of measured values of temperature sensors and assessment of O2 capsules. To do so, switch unit on, wait for 30 s self-test to be completed and press buttons „horn off“ and „air temperature“ simultaneously for 8 s. „S“ is indicated on the actual value displays in the humidity, O2 and skin temperature (if applicable) modules and the number of the service mode flashes in the air temperature module on the lower right display. | | |



A,B,C,D,E =
measured values
or data

X = no. of service
mode (flashing)

The next mode each can be reached by pressing the button „+air temperature“.
In case of SW 0.4 the service mode can be exited any time by pressing one of the „control“ buttons, in case of SW 1.00 by pressing the key „check lights“.

3.1 Mode 0: software-version

A.B.or
AB.CD

V

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3.2 Mode 1: operating hours

A B C D E in hours

V

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3.3 Mode 2: actuations of button „check lights“

A B C D E = no. of actuations

V

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3.4 Mode 3: actuations of button „check 36.0 °C“ (only if skin temperature module is available)

A B C D E = no. of actuations

V

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3.5 Mode 4: Sensor switch test in air temperature sensor

Air temp. sensor swivelled in = 1
Air temp. sensor swivelled out half = 2
Air temp. sensor swivelled out = 3
Air temp. sensor detached = 4

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3.6 Mode 5: Measured value of overtemperature sensor in °C

The max. deviation from the measured value of the air temperature sensor (mode 6) may be 0.3 °C.

V

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3.7 Mode 6: Measured value of the air temperature sensor in °C

V

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| 3.8 | <p>Mode 7: Measured value of O₂ sensor A (outer capsule in air temperature sensor)</p> <p>A B C = decimal value of A/D converter.</p> <p>At 21 % by vol. O₂ values ranging from 306 (= 9.5 mV) to 812 (= 25 mV) are allowed.</p> | V | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 3.9 | <p>Mode 8: Measured value of O₂ sensor B (inner capsule in air temperature sensor)</p> <p>A B C = decimal value of A/D converter.</p> <p>At 21 % by vol. O₂ values ranging from 306 (= 9.5 mV) to 812 (= 25 mV) are allowed.</p> <p>Note concerning exchange of the O₂ sensors:</p> <p>Should the values be below 325 (= 10 mV) the sensors should be replaced.</p> | V | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 3.10 | <p>Mode 9: A B C = measured value of humidity sensor in % relative humidity</p> | O | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 3.11 | <p>Severe 10 minutes test (for SW 1.00 only)</p> <p>To do so, press button „reset overtemperature“ in service mode 10 times every 2 seconds.</p> <p>No „INOP“ error message.</p> | O | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| <hr/> | | | | | | | | | | | | | |
| 4. | <p>Replacement of wear and tear parts electronics</p> <p>To do so, fold down the flap below the electronics module after loosening the 2 or 4 screws.</p> | | | | | | | | | | | | |
| 4.1 | <p>* Replace battery 83 01 856 on the PCB Power Pack every year.</p> | O | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 4.2 | <p>* For SW 0.4 only</p> <p>Convert to SW 1.00 using time keeper RAM after 6 years at the latest. Conversion kit SW 1.00 with T-K-RAM 82 90 578.</p> <p>Note: Replaces the current battery on the PCB CPU.</p> | | | | | | | | | | | | |

Note:
Electrostatically sensitive sub-assembly!

Afterwards re-enter data from service mode 1, 2 and 3.

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Note:
Do not close flap!

5. Technical safety check

To do so, fold down flap below electronics module after looseing the 2 or 4 screws.

5.1 Protective conductor test

Test points:

- Protective conductor terminal at the left side of the unit
- trolley
- screws at the height-adjustable pedestal
- flap below electronics module.

Test value: R lower than 0.2 Ohm.

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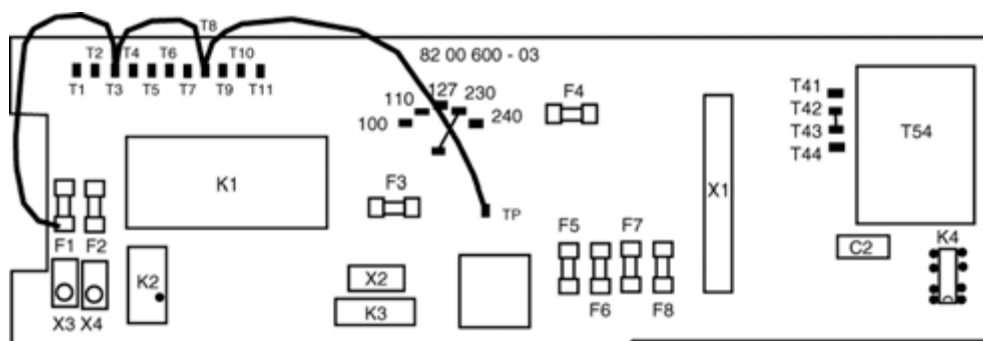
| | | | | | | | | | |
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5.2 Equivalent leakage current measurement

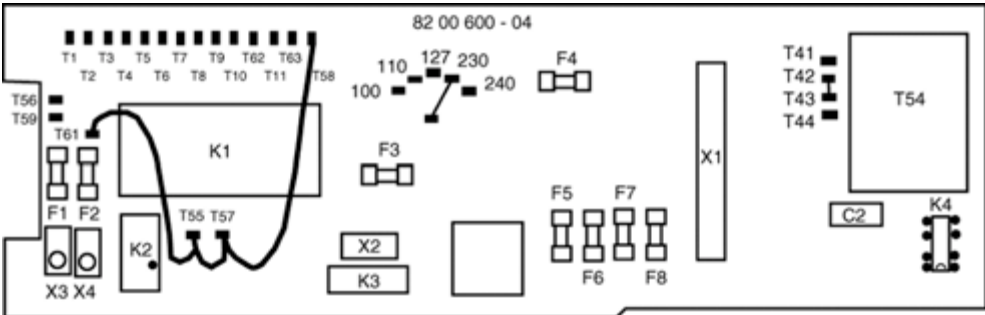
Note: Detach mains connection before!

For measurement purposes the switch-on relay and the safety relay must be jumpered.

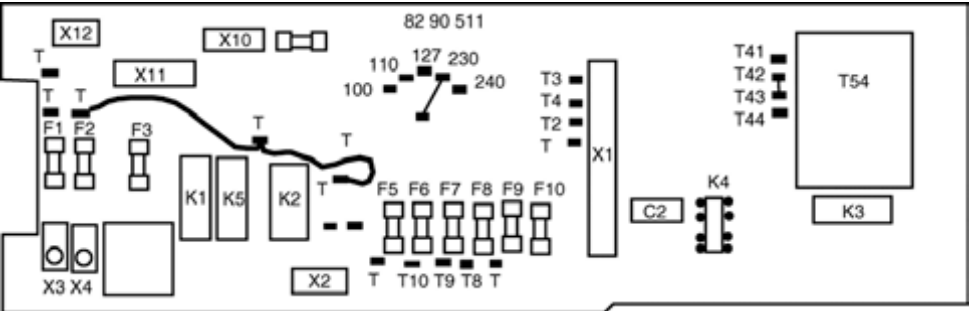
PCB Unit 82 00 600-3:



PCB Unit 82 00 600 > 4:



PCB Unit 82 90 511:



Actuate height adjustment for measurement Subsequent measurements may exceed the first measured value of the test certificate by 50 % max., but must not exceed the specified test value.

Test value: I_A lower than 1.0 mA

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Note:

The first measured value must be recorded in the new test certificate.

First measured value: I_A = mA

With Gerb Eutotester GM-50

Switch positions on Gerb Eurotester:

Application part: all

IEC/VDE standard: VDE 751

Protection class: 1

Test item: Equivalent device leakage current SL

Insert power plug of Incubator 8000 into test receptacle of the Gerb Eurotester.

Important:

The measured values indicated on the Gerb Eurotester are approx. 10% lower than the measured values indicated on the Wison VDE tester.

Make sure Incubator 8000 is switched on.

Subsequent measurements may exceed the first measured value of the Test Certificate by 50% max. but must not exceed the specified test value.

Test value:

Equivalent device leakage current: lower than or equal to 1.0 mA

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Note:

The first measured value must be recorded in the new Test Certificate.

Note:

After measurement was performed the connections of the solder tags must be removed.

5.3

Visual check

Visual Check of the mains power conducting cables. The power cords and all visible connecting cables to the unit must be attached safely. A voltage diversion to other parts of the unit, e.g. bed height adjustment must be impossible.

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5.4

Bed height adjustment

Visual check of the chain drives. The holders in the chain for the supports of the bed must be fixed securely.

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Close flap below electronics module and assemble incubator ready for operation.

6.

Function check

6.1

Agreements on subesequent function checks

Red alarm LEDs are located on the front panels of all modules. If one of these LEDs lights up or flashes, this alarm is transferred to the red central LED „alarm“ and an audible alarm is given.

Intermittent audible alarms can be suppressed by pressing the button „horn off“; this does not apply to continuous audible alarms. By pressing the button „horn off“ only the audible alarm currently active is suppressed; any additional alarm occurring activates the horn again.

When the incubator is switched on the audible alarm „inadequate air temperature“ is suppressed for 30

minutes.

When after calibration of the O₂ measurement function the air temperature sensor was swivelled in, the air heating is switched off for 90 s and the audible alarm suppression $\pm 5\%$ by vol. O₂ is activated. In addition the audible alarm suppression $\pm 1.5\text{ }^{\circ}\text{C}$ is activated for 10 minutes.

When the incubator or one of the modules were switched on, „SEt“ and the actual value display flash alternately as a request for acknowledgement of the desired values (except for alarms in the respective module). Acknowledgement is performed by pressing the button „+desired value“ or „-desired value“. Flashing of „SEt“ is only an advisory.

Height adjustment with function of end stops up and down

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6.2 Incubator basic functions

Switch incubator on.

Green operating LED lights up. Dashes are indicated on the actual value display of all modules for 30 s.

Any overtemperature warning can be deactivated by pressing the „reset!“ button.

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6.2.1 Press button „Check lights“

All LEDs except for the power failure LED light up; all digital displays indicate 88.8 and a continuous tone sounds. LEDs and displays are then blanked for 1 second and the horn is deactivated.

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6.3 Air temperature module

The desired value of $33.0\text{ }^{\circ}\text{C}$ flashes. „SEt“ and the current air temperature flash alternately in the actual value display. Acknowledge desired value by pressing „+air temperature“ or „-air temperature“:

Continuous display of desired value and actual value (except for alarms in the air temperature module).

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6.3.1 Checking the desired value setting

Press button „-air temperature“ once. The desired value decreases by 0.1 °C.

Keep button „-air temperature“ pressed. The desired value decreases to 28 °C.

Press button „+air temperature“ once. The desired value increases by 0.1 °C.

Keep button „+air temperature“ pressed. The desired value increases to 37 °C.

Press button „>37 °C“. Yellow LED „<37 °C“ lights up.

Keep button „+air temperature“ pressed. The desired value increases to 39.0 °C

If the actual value is lower than the desired value. Green heating LED flashes.

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6.3.2 Set desired value to 36.0 °C

Comparison measurement in the centre of the bed at a height of 10 cm using thermometer 2M 11111.

Test value: 36.0 ±1.5 °C

Note:
Check the O2 module during the warm up phase -> [6.4](#).

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6.3.3 Set desired value by 1.6 °C lower or higher than the actual value

Actual value display, LED „± 1.5 °C“ and LED „alarm“ flash and intermittent audible alarm.

Press button „horn off“.

Horn off, actual value display flashes, LEDs „+ 1.5 °C“, „alarm“ and „horn off“ light up.

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6.3.4 Additional fan

Set desired value by 1.0 °C higher than actual value.

Heating LED flashes, additional fan stops.

Set desired value by 1.0 °C lower than actual value.

Heating LED off, additional fan works, no abnormal noise.

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| 6.3.5 | <p>Heating fan</p> <p>No abnormal noise of fan motor and impeller.</p> <p>Then set desired value to 37.0 °C.</p> | O | <input type="text"/> |
| 6.3.6 | <p>Swivel out air temperature sensor and remove it from the retainer</p> <p>Visual and audible sensor alarm, heating off.</p> | O | <input type="text"/> |
| 6.3.7 | <p>Pull plug for air temperature sensor</p> <p>Visual and audible sensor alarm, heating off.</p> <p>Then connect air temperature sensor ready for operation.</p> | O | <input type="text"/> |
| 6.4 | O2 module | | |
| 6.4.1 | <p>Switch on O2 module by pressing button „control“ in the O2 module</p> <p>Green LED „Control“ lights up.</p> <p>The actual value after switch-on is 21% by vol. O2 and flashes. The yellow LED „Cal.“ flashes. „CAL“ flashes in the actual value display.</p> | O | <input type="text"/> |
| 6.4.2 | <p>Swivel air temperature sensor out of incubator and press button „Cal.21 % by vol.“</p> <p>The LED „Cal.“ lights up in the calibration phase and „cal.“ and „--“ flash alternately on the actual value display.</p> <p>Once calibration was completed „21“ and „SEt“ flash alternately on the actual value display.</p> <p>Do not swivel in air temperature sensor. After 60 s a visual and audible sensor alarm are given.</p> <p>Swivel in air temperature sensor.</p> <p>No sensor alarm in O2 module Acknowledge desired value by pressing the button „+desired value“ or „-desired value“ O2.</p> <p>Continuous display of desired value and actual value O2 (except for alarms in the O2 module).</p> | O | <input type="text"/> |

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| 6.4.3 | O2 sensor alarm | | |
| | Unscrew first O2 sensor. | | |
| | Visual and audible sensor alarm. | O | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| | Screw in O2 sensor and recalibrate. | | |
| | Unscrew second O2 sensor. | | |
| | Visual and audible sensor alarm. | O | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| | Screw in O2 sensor and recalibrate. | | |
| 6.4.4 | Checking of desired value adjustment using buttons „+desired value“ and „-desired value“ O2 as for air temperature module. For settings exceeding 40% by vol. O2 up to 75% by vol. O2 the button „>40 % by vol.“ must be pressed before. Should the actual value deviate by more than $\pm 5\%$ by vol. from the desired value, a visual and audible alarm are given. | O | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 6.4.5 | O2 pressure connection | O | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 6.4.5.1 | CS-O2 connecting hose | C L | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 6.4.5.2 | * Replace filter screw 2M 19622 in gas connection every 2 years | | |
| | Note: In Inc. 800 with gas connection located at the bottom of the trolley also filter insert Dp02316 (replace every 2 years) or without filter possible. | C | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 6.4.5.3 | Internal O2 pressure hose in the pedestal (only available in the first Inc. 8000). | C L | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 6.4.6 | Flow measurement downstream of valves, to do so establish O2 pressure supply | | |
| | To do so unscrew the sheet steel in front of the particulate filters and measure the flow at the tube with the 8 mm Allen key. | | |
| 6.4.6.1 | Specified desired value 21% by vol. O2: float must not lift off with smallest flowmeter. | L | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 6.4.6.2 | Specified desired value by 1% higher than actual value (1 valve open) | | |
| | $V = 14 \pm 1/3$ L/min | O | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 6.4.6.3 | Specified desired value by 4% higher than actual value | | |
| | $V = 28 \pm 2/6$ L/min | O | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| | Assemble unit ready for operation. | | |

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| 6.4.6.4 | Flow measurement at the O2-nozzle for external oxygen supply with valves opened. Specified desired value by 4% higher than actual value. | | | | | | | | | | | | |
| | V lower than 0.2 L/min | L | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 6.4.7 | Establish O2 pressure supply 5.0 ±0.5 bar and set desired value to 40% by vol. O2. The set value is reached after 4 minutes max. Comparison measurement using Oxydig: | | | | | | | | | | | | |
| | Test value: 40 +4% by vol. O2. | O | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 6.5 | External oxygen supply | | | | | | | | | | | | |
| | To do so, supply 7.5 ±0.5 L/min O2 oxygen to the incubator via O2 socket. Comparison measurement using an Oxydig after 30 minutes. | | | | | | | | | | | | |
| | Test value: 40 +4/-6% by vol. O2. | O | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | If the test value is not reached the Incubator is leaky or the fresh air intake is faulty. | | | | | | | | | | | | |
| | The following must be checked should an error occur. | | | | | | | | | | | | |
| | Does the canopy have additional openings? Are the sealings 2M 19595 available at trough 2M 19334 (item 2.11 of test certificate)? | | | | | | | | | | | | |
| | Valve leakage (item 2.17 of test certificate) in the fresh air intake, for checking the valve leakage glue up the valve and repeat test item 6.5. | | | | | | | | | | | | |
| 6.6 | Humidity module | | | | | | | | | | | | |
| 6.6.1 | Holder for infusion jars with 3 jars DIN 58363 13 40 697 | O | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 6.6.1.1 | Jar sealing rings 2M 16045 | C L | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 6.6.1.2 | Silicone hose between evaporator and jar holder | C L | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 6.6.2 | Switch on humidity module by pressing button „control“ in the humidity module | | | | | | | | | | | | |
| | Green LED „Control“ lights up. The desired value following switch-on is 60% rel. humidity and flashes. | | | | | | | | | | | | |
| | The relative humidity measured and „SEt“ flash alternately. | | | | | | | | | | | | |
| | Display range from 0 to 99%. | | | | | | | | | | | | |

Acknowledge desired value by pressing the button „+desired value“ or „-desired value“ humidity.

Continuous display desired value and actual value (except for alarms in the humidity module).

- 6.6.3 Checking of the desired value adjustment with buttons „+desired value“ or „-desired value“ humidity as for the air temperature module within the limits 35% and 85%, but with 5% increments.

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- 6.6.4 Set desired value to 85% rel. humidity. Press the buttons „+desired value“ and „-desired value“ humidity simultaneously for approx. 3 s.

The „heating LED“ of the evaporator flashes in the right-hand digit of the actual value display.

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- 6.6.5 Water shortage alarm

To do this, fold down backpanel with water jars filled.

Visual and audible water shortage alarms are given after a few minutes (depending on start temperature of evaporator up to 25 minutes). Suppress the audible alarm by pressing the button „horn off“.

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- 6.6.5.1 Fold up backpanel with water jars

H2O alarm LED off after 6 minutes max.

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- 6.6.6 At a desired value of 85% rel. humidity water condenses at the top of the canopy between an indicated rel. humidity of 60% and 85% at an incubator temperature > 36.0 °C and an ambient temperature of 20 °C to 26 °C.

At least a display value of 80% rel. humidity must be attained.

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- 6.7 Skin temperature module (if applicable)

- 6.7.1 Swivel out air temperature sensor, connect skin temperature sensor and swivel in air temperature sensor.

The sensor temperature is indicated. If the temperature is outside the measuring range of 33.0 °C to 38.0 °C, the following is indicated on the actual value display:

beyond the measuring range: " --- "

below the measuring range: " _ _ _ "

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6.7.2 Press button „check 36 °C“

Display of actual value skin temperature sensor = 36.0 ± 0.1 °C.

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All other measurements up to item 6.7.6 to be carried out with the skin temperature sensor in a water bath with a temperature of 33 to 38 °C.

6.7.3 Comparison measurement between skin temperature sensor and thermometer 2M 11111.

Test value: allowed deviation 0.4 °C.
Check the sensor for cable break.

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6.7.4 Switch on skin temperature module with button „Control“ in the skin temperature module

Green LED „Control“ lights up. The current skin temperature actual value is taken over as desired value and flashes:

Exception:

a) act. value < 35.0 °C \rightarrow des. value = 35.0 °C

b) act. value < 37.0 °C \rightarrow des. value = 37.0 °C

The current skin temperature actual value and „SEt“ flash alternately.

Acknowledge desired value by pressing the button „+desired value“ or „-desired value“

Skin temperature:

Continuous display of desired value and actual value of skin temperature (except for alarms in the skin temperature module) O

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6.7.5 Checking the desired value adjustment with buttons „+desired value“ and „-desired value“ skin temperature within the limits of 35.0 °C to 37.0 °C.

Should the actual value deviate by more than 0.5 °C from the desired value a visual and audible alarm are given.

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6.7.6 Pull plug of skin temperature sensor

Visual and audible sensor alarm, heating off.

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Then press button „Control“ in the air temperature module and set air temperature desired value to 39.0 °C.

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| 6.7.7 | Calibration of skin temperature sensor and skin temperature module (only applies in the Federal Republic of Germany) | | | | | | | | | | | | |
| | Inform the customer should the calibration validity period be less than 6 months. | O | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 6.8 | Power failure alarm | | | | | | | | | | | | |
| | Set air temperature desired value to 39.0 °C, O2 desired value to 40% by vol. and humidity desired value to 85%. | | | | | | | | | | | | |
| | Disconnect power cord for one minute. | | | | | | | | | | | | |
| | Continuous visual and audible alarm. | | | | | | | | | | | | |
| | Establish mains connection. | | | | | | | | | | | | |
| | The desired values have not changed. | O | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 6.9 | Software overtemperature alarm | | | | | | | | | | | | |
| | Set air temperature desired value to 39 °C and allow incubator to warm up. If the display in the air temperature module is greater than or equal to 38.1 °C, set the desired value to 37.0 °C. | | | | | | | | | | | | |
| | Visual and audible overtemperature alarm. | O | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | Switch unit off and on again. | | | | | | | | | | | | |
| | Overtemperature alarm is retained. | O | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | Set air temperature desired value to 39 °C and press button „overtemperature reset“. | | | | | | | | | | | | |
| | No „overtemperature“ alarm. | O | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 6.10 | Clear error list | O | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | Note: For SW 0.4 only clear up to and including error 67. | | | | | | | | | | | | |
| <hr/> | | | | | | | | | | | | | |
| 7. | Make unit available to the user in a ready-to-operate condition. | | | | | | | | | | | | |
| 7.1 | All unit covers and components must have been fixed in position | C | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 7.2 | There must be no dirt or tackiness noticeable on the unit which could impair safety | C | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
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|-----|--|---|--|--|--|--|--|--|--|--|--|--|--|
| 7.3 | Check unit labelling | C | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 7.4 | The incubator must be standing firmly and steadily | C | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 7.5 | Visually inspect unit assembly for perfect condition | C | <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | |
| | | | | | | | | | | | | | |

8. Test Certificate

Name:

Date:

Signature:

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

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9. * These steps are regarded as repair work and are therefore not included in the inspection service price.

[illegible]

11. Appendix

11.1 Test equipment

| | |
|---|-----------|
| Flowmeter, 10 to 120 L/min | 79 00 718 |
| Flowmeter block, 0,2 to 14 L/min | 79 01 161 |
| Flowmeter O2, 16 L/min, 5 bar | 2M 85 502 |
| Oxydig, complete | 83 04 411 |
| or | |
| MiniOx 3000 | 2M 22 464 |
| or national equivalent oxygen measurement device | |
| Thermometer | 2M 11 111 |
| or | |
| Temperature- and humidity measurement device | 79 10 980 |
| Socket wrench set, 1/4" | 79 00 905 |
| Mains power tester Secutest | 79 10 594 |
| or national equivalent mains power tester for 110/127 V voltage range | |
| Sensor simulator, skin temperature | 79 01 236 |
| Sensor simulator, Incubator 8000 | 79 01 240 |
| Test connector 36 °C | 79 11 314 |
| Dummy assembly, Incubator 8000, complete with connecting cable | 79 01 764 |
| Measuring lead, red 0,25 m | 79 00 679 |
| Measuring lead, black 0,25 m | 79 00 680 |
| Measuring probe, red Kleps 30 | 79 01 026 |
| Measuring probe, black Kleps 30 | 79 01 027 |
| Touch-up applicator, blue munsell | 79 01 261 |
| Touch-up applicator, light orange munsell | 79 01 262 |

11.2 Tools and supplies for repair

| | |
|--|-----------|
| Teflon strip 12 x 0,1 1-PTFE/BAM-DVGW CS | 11 92 507 |
| Oil HLP 32, 10 mL bottle, DIN 51524 | 2M 07 839 |
| Cabel ties 2,4 x 200 | 87 12 065 |
| Cotter-pin driver C2, 2 mm | 79 10 216 |
| Water pump pliers, 175 mm | 79 01 283 |

11.3 Spare parts

| | | |
|-------------------|--|-----------|
| every maintenance | - ambient filter | 84 02 926 |
| yearly | - rechargeable battery (Accu) | 83 01 856 |
| | - bakterial filter (Option „Bronchus-Absaugung“) | 67 23 976 |
| every 2 years | - filter screw | 2M 19 622 |
| every 6 years | - spring of spring catches | 84 00 496 |
| | - pressure regulator (Option „O2 controlling“) | 84 02 745 |